

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
21 May 2004 (21.05.2004)

PCT

(10) International Publication Number
WO 2004/041311 A1

- (51) International Patent Classification⁷: **A61K 51/04**,
C07F 9/50
- (21) International Application Number:
PCT/EP2003/012128
- (22) International Filing Date: 31 October 2003 (31.10.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
02024803.5 7 November 2002 (07.11.2002) EP
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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:**
- with international search report
 - before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: RADIOACTIVE TRANSITION METAL-IMIDO HETERO-DIPHOSPHINE COMPLEXES, THEIR PREPARATION AND RADIOPHARMACEUTICAL COMPOSITIONS THEREOF

(57) **Abstract:** The present invention provides radioactive metal heterocomplexes of formula (I): $[(Me=N-R)L_1L_2] + Z$ (I), wherein Me, R, L^1 , L^2 and Z have the meanings indicated in the description. The complexes include a trivalent radioactive metal-imido group, typically a technetium- or rhenium-imido group, strongly stabilized by the presence of an ancillary tridentate hetero-diphosphine ligand L^1 , which allows the formation of substitution-inert $[(Me=N-R)L^1]$ moieties. Such moieties are fixed in an intermediate $[(Me=N-R)Y_2L^1]^+$ compound which contains two labile, cispositioned, Y ligands, where Y is preferably an halide group. The latter are easily replaced by a bidentate ligand L^2 to give the final $[(Me=N-R)L^1L^2]^+ Z^-$ heterocomplexes. The complexes of the invention are useful for the preparation of radiopharmaceuticals: in fact, a bioactive fragment which confers biological target-seeking properties can be introduced either on the L^2 framework or the imido R group.